STUDY OF PRESCRIPTION PATTERN OF INSULIN IN DIABETIC PATIENTS IN A TERTIARY CARE TEACHING HOSPITAL

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ABSTRACT

Diabetes has become one of the major causes of premature illness and death in various countries. Insulin administration was found to be a better choice for diabetic patients who started surviving for longer periods till they developed vascular complications or infections. Although proper and appropriate insulin administration can prevent many of the adverse outcomes associated with hyperglycemia, there is a lack of patient education on proper glucose monitoring and optimization of insulin therapy. Our objective was to study the prescription pattern of insulin in diabetic patients in a Rural Tertiary Care Teaching Hospital. This study is a Prospective and Observational study. Adults and geriatric patients of either sex, diagnosed as Diabetes and those on insulin therapy were included in the study. A special design pro-forma was used to collect the data. Data was collected from patient prescriptions, patient case sheets, questionnaires. The data obtained was categorized as age, gender, medical and family history, distribution of insulin brands, oral hypoglycemics. During the study period of six months (October 2013 to April 2014), a total of 120 patients diagnosed with diabetes were enrolled in the study, out of 81(67%) were males and 39(33%) were females, 7 patients(5.83%) belonged to the age group 30-40, 18 patients(15%) belonged to the age group 41-50, 35(29.6%) were from the age group 51-60, 43(35.83%) were from the age group 61-70, 13 patients(10.83%) belonged to the age group 71-80 and only 4 patients(3.33%) were found to be in the range of 81-90 years. Among the study population, 96(80%) were found to be having an history of Type2 DM and 29(24.16%) patients were found to be having family history of Type2 DM. 96(80%) had a history of Type 2 DM and it can be illustrated that among this 96 patients, 7(7.29%) patients were having a history of diabetes not more than 1 year, 1-5 years of medical history were found for 37(38.54%) patients, 35(36.45%) patients were having medical history between 5-10 years, 12(12.5%) patients were found having medical history between 10-15 years, Between 15-20 years, only 4(4.16%) patients were found to have the history of Diabetes and only 1(1.04%) patient had a medical history greater than 25 years. Patients found to be administered with Human Actrapid and 11(9.16%) patients were prescribed with Human mixtard, 84 patients(70%) were on insulin monotherapy and 36 patients(30%) were found to be administered with both insulin and oral hypoglycemics, the total number administered with oral hypoglycemic were 49, out of which 40(81.63%) patients were prescribed with metformin alone, 8(16.32%) patients were prescribed with metformin+gliclamepiride and only one patient(2.02%) were found prescribed with Metformin+glibenclamide.

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INTRODUCTION

Diabetes mellitus often referred as is a chronic metabolic condition or disorder of elevated blood sugar level associated with absence or inadequate pancreatic insulin secretion, with or without concurrent impairment of insulin action.

Diabetes is classified into four types
- Type I Diabetes mellitus Insulin dependent
- Type II Diabetes mellitus Non insulin dependent
- Type III Diabetes mellitus Alzheimers Disease
- Gestational Diabetes

The goal of insulin administration in patients with diabetes is to mimic normal physiologic secretion of insulin to control plasma glucose levels. Insulin therapy is mainly used for treating the patients with type 1 diabetes while type 2 diabetic patients are mainly treated with oral hypoglycemic agents. But some patients with type 2 DM who do not respond well to the oral hypoglycemic agents and show less response during the therapy, require the treatment with insulin within 3-6 months.[1,2,3,4,5,6,7]

Management of DM includes the employment of non-pharmacological and pharmacological interventions such as oral hypoglycemic agents like sulphonylureas, biguanides, thiazolidinediones etc. and different types of insulin preparations such as neutral insulin, biphasic insulin, isophane insulin etc. out of which insulin therapy plays a prominent role. Insulin therapy is complex and challenging. The initiation of insulin therapy depends on several factors which include patient’s willingness, frequency and awareness of hypoglycemia, lifestyle factors, and cost. Insulin remains one of the most effective methods for achieving glycemic control in patients with Type 2 Diabetes, either alone or in combination with anti-diabetic oral medications.[5,7,8,9,10]

Although proper and appropriate insulin administration can prevent many of the adverse outcomes associated with hyperglycemia, there is a lack of patient education on proper glucose monitoring and optimization of insulin therapy. Pharmacists can play a vital role in care of the patients by educating them about their disease state, role of insulin therapy and handling adverse reactions to therapy, if any. Pharmacists can work with patients and physicians to identify possible causes of failure to achieve glycemic control by reviewing prescribing patterns of insulin.

Reviewing prescribing patterns could provide feedback to prescribers and assures quality medical care.

The current study has been taken for getting knowledge about the pattern of insulin prescription or insulin with other oral hypoglycemics and problem associated with its use along with demographic profiles among diabetic patients.[4,7,14,15,16]

MATERIALS AND METHODS

A study is a Prospective and Observational study was carried out at Adichunchanagiri Hospital & Research centre( AHRC) B.G. Nagar, Mandya, Karnataka. This study was conducted for a period of six months(October-2013- April-2014). Adults and geriatric patients of either sex, diagnosed as Diabetes and patients who are on Insulin therapy were enrolled in this study. A special design pro-forma was used to collect the data, patients were asked questions based on the questionnaires designed. Other study materials used were patient prescriptions, case sheets, information leaflets. The personal data was classified by gender, age, distribution of brands, patients prescribed with insulin alone and insulin in combination with other oral hypoglycemics.

RESULT

Figure 1: shows the distribution of gender among the study population.

Table 2 shows the distribution of insulin brands.

<table>
<thead>
<tr>
<th>Insulin brands</th>
<th>Numbers</th>
<th>Percentage(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human Actrapid</td>
<td>109</td>
<td>90.83</td>
</tr>
<tr>
<td>Human Mixtard</td>
<td>11</td>
<td>9.16</td>
</tr>
</tbody>
</table>
Figure 2: illustrates the distribution of insulin brands.

Table 3: shows patients prescribed with insulin alone or insulin in combination with other oral hypoglycemic.

<table>
<thead>
<tr>
<th>Drug</th>
<th>Numbers</th>
<th>Percentage(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulin</td>
<td>84</td>
<td>70</td>
</tr>
<tr>
<td>Insulin with oral hypoglycaemic</td>
<td>36</td>
<td>30</td>
</tr>
</tbody>
</table>

Figure 3: illustrates patients prescribed with insulin alone or insulin in combination with other oral hypoglycemic.

Table 4: shows the distribution of oral hypoglycemic.

<table>
<thead>
<tr>
<th>Drug</th>
<th>Number</th>
<th>Percentage(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metformin</td>
<td>40</td>
<td>81.63</td>
</tr>
<tr>
<td>Metformin+glimepiride</td>
<td>08</td>
<td>16.32</td>
</tr>
<tr>
<td>Metformin+glibenclamide</td>
<td>01</td>
<td>2.02</td>
</tr>
</tbody>
</table>

Figure 4: illustrates the distribution of oral hypoglycemic.
Table 5: shows the patient response to questionnaires before and after counseling.

<table>
<thead>
<tr>
<th>SNo</th>
<th>Before counselling</th>
<th>After counseling</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>01</td>
<td>109</td>
<td>11</td>
</tr>
<tr>
<td>02</td>
<td>55</td>
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<td>03</td>
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<td>09</td>
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<td>62</td>
</tr>
<tr>
<td>10</td>
<td>38</td>
<td>82</td>
</tr>
</tbody>
</table>

Figure 5: illustrates the response of patients to the questionnaires before and after counseling.

DISCUSSION

Diabetes has become one of the major causes of premature illness and death in various countries. The achievement and maintenance of optimal glycemic control is a critical step among diabetes to prevent complications. The discovery of insulin has been a cornerstone for diabetes care. The continued prevalence of the disorder and changing prescribing patterns with the fluctuating blood sugar level indicate to evaluate the management of this disorder.

A total of 120 patients were enrolled in the current study. The prevalence of DM in our sample population was found higher in males 81(67%) when compared to females 39(33%) which was similar statistically in studies done elsewhere [17, 18]. These results however cannot predict the exact reason behind this kind of distribution, however it should be kept in mind that the sample largely belongs to the rural population in which lack of awareness about healthy life style can be a contributing factor which however is out of scope of the current study. Majority of the study population 95(79%) belongs to the age group of 50-80 years. A similar kind of results were observed in several studies done elsewhere wherein majority of the study population was from the elderly age group [7, 17]. Such results further necessitates the close monitoring of diabetes therapy in elderly population as they are in higher risk of developing diabetes and related complications specifically with the use of insulin as non-compliance and improper administration both may adversely affect the goals of treatment in these cases. In our study, majority of the patients 109(90.83%) were prescribed with Human Actrapid and 11(9.16%) patients were prescribed with Human mixtard. A similar study was conducted in SreeRamachandra University involving 350 patients, revealed that 248(70.8%) were found to be administered with Human mixtard. 49(14%) were administered with Human Actrapid. Insulatard was administered to 22 (6.28%) patients. Insulin Mixtard and Insulin H.Actrapid was given together to 14(4%) patients, 10(2.8%) were administered with Regular Human Insulin + Human Insulin N. Human insulin was administered to 7(2%) patients. The difference can be understood by the fact that the current study was undertaken in inpatients providing the advantage of close monitoring while the patients are being hospitalized. The safety of metformin is well established when compared to other oral hypoglycemic drugs making it the drug of choice in elderly patients, a similar trend was observed in current study wherein majority of the population was prescribed with metformin monotherapy or combination with metformin as one of the component.
A similar study conducted at SreeRamachandra University, a similar sort of results were observed where metformin contributed as the mainstay of treatment either as monotherapy or in combination with other oral hypoglycemic agents. [7]. The knowledge of patient about insulin use and adverse effects has always been a matter of research and it’s been proven that if the patients are counselled properly about their therapy, better results can be achieved with respect to quality of life of the patients and achievement of therapeutic goals. In a similar study conducted in Diabetic Centre of Lagos State University Teaching Hospital, the adverse effects of insulin and hypoglycemic therapy was assessed with the help of questionnaire consisting of 9 questions assessing the knowledge of insulin, storage requirements of insulin, site change during insulin therapy, discomfort during therapy, dosage adjustments, dietary modifications, management of hypoglycemic conditions, complications of diabetes. It was observed that patient knowledge about their insulin preparation and dosage was increased when they were counselled for the same and also the incidence of adverse effects come down significantly with proper counselling of the patients[9]. A similar kind of results were observed in the current study where in it was observed that the overall knowledge of the patient and their understanding about their insulin therapy increases with proper counselling which not only help them in improving the quality of life but also helps in reducing the complications and discomfort caused due to improper use of insulin preparation. Moreover it helps in assuring an increase in compliance of the patients to their prescribed insulin therapy

CONCLUSION
The study concluded a significant positive association between counseling by clinical pharmacist and the use of insulin therapy, as insulin was amongst the mainstay of treatment within the study population. It is well known fact that if insulin is not used properly it may exhibit discomfort in the form of unwanted side effects to the patients receiving it. It was observed that when a patient understand his/her therapy, better chances of positive outcome, which is directly linked with better compliance and lesser side effects with optimal results. Therefore it is always important to educate the patient about various aspects of insulin therapy including dosage, storage, site of injection, common side effects and lifestyle modifications. Pharmacist can play a vital role in monitoring and optimization of insulin therapy.

Future Directions
✓ Study on a larger population on which follow up can be done.
✓ Other comorbidities can be considered in the inclusion criteria in the future study.

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Authors to thanks to Sri Adichunchanagiri Hospital and Research Centre for the kind support.

Abbreviations
DM  Diabetes mellitus
AHRC  Adichunchanagiri Hospital and Research Centre

REFERENCES